EXTERNAL STORAGE DEVICE FOR IMAGE PICKUP APPARATUS, CONTROL METHOD THEREFOR, IMAGE PICKUP APPARATUS AND CONTROL METHOD THEREFOR

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an external storage device for an image pickup apparatus for backup storage of an image taken by the image pickup apparatus, and also to a control method therefor, an image pickup apparatus and an image management method.

Related Background Art

Fig. 18 is a schematic block diagram showing the configuration of a conventional digital camera, wherein a camera module 210 is composed of an image pickup lens 212, an image pickup element 214 of CCD type, an image pickup element control circuit 216 and an image processing circuit 218. When an image pickup operation mode is selected after the power supply is turned on, a CPU 220 initializes the camera module 210 and renders it operable, and also activates a display system composed of an LCD display device 222, a display drive circuit 224, an LCD control circuit 226 and a VRAM (video memory) 228. The LCD display device 222 functions as an electronic view finder and has a display ability of 640 × 480 pixels.

The image pickup element 214 converts an

optical image, formed by the image pickup lens 212, into an electrical signal. The image pickup element control circuit 216 executes noise elimination and gain adjustment on the image signal outputted from the image pickup element 212 and converts the signal into a 10-bit digital signal for supply to the image processing circuit 218. The image processing circuit 218 applies processes such as white balancing, exposure adjustment, correction for flash exposure etc. to the image data from the image pickup element control circuit 216 and converts the image data into the YCbCr format (Y: luminance signal, Cb, Cr: color difference signals). In case the image pickup element 214 has about two million pixels, the image processing circuit 218 can process the image data of about 1600 × 1200 pixels, but processes the image data normally in a size of 320 × 240 pixels and 640 × 480 pixels at largest in the stage of displaying in the view finder.

The CPU 220 supplies the YCbCr image data from the image processing circuit 218 to the LCD control circuit 226 by DMA (direct memory access) method in a display size of 320 × 240 pixels. The LCD control circuit 226 once stores the YCbCr image data from the CPU 220 into the VRAM 228 after conversion into the RGB format, and then reads the image data from the VRAM 228 for supply to the display control circuit 224, which drives the LCD display device 222 according to the RGB

data from the LCD control circuit 226. In this state, a monitor image (object image) of 320 × 240 pixels is displayed in an arbitrary portion in the image area of 640 × 480 pixels of the LCD display device 222.

By executing the process from the readout of the image pickup element 212 to the display on the LCD display device 222 in continuous manner with a cycle time of 1/30 seconds, an object image corresponding to the optical image entering the image pickup element 212 is constantly displayed on the image area of the LCD display device 222.

In case of taking an image, the user switches the apparatus to an image pickup mode. When a shutter switch 230 is depressed, the CPU 220 locks the set values of the white balancing, exposure adjustment, correction for flash photographing etc. in the image processing circuit 218, and terminates the function of the LCD control circuit 226, the display drive circuit 224 and the LCD display device 222 in order to alleviate the load of the CPU 220.

In a view finder process, there is processed only a part of the image data of the image pickup element 212 in order to increase the processing speed, but the entire image data of 1600 × 1200 pixels are processed in the image pickup mode. More specifically, the image processing circuit 218 applies the aforementioned process to the image data of all the